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Question Paper Code : 60443

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Third Semester

Electronics and Communication Engineering

EC 2202/EC 33/10144 EC 303/080290009 – DATA STRUCTURES AND OBJECT ORIENTED PROGRAMMING IN C++

(Regulations 2008/2010)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define class and objects.

2.   Define inline functions and friend functions.

3.   How to initialize a pointer?

4.   What is runtime polymorphism?

5.   What is a priority queue?

6.   Define recursion and specify the data structures used to perform recursion.

7.   Mention the types of rotations performed on AVL trees.

8.   When is a Binary Search tree a heap? Justify.

9.   What is K-way merge?

10.   Write the template for depth-first search.

PART B — (5 × 16 = 80 marks)

11.   (a)   Explain with examples the types of constructors in C++.

Or

      (b)   Write a C++ program that contains a class String and overloads the following operators on Strings.

             + to concatenate two strings

             – to delete a substring from the given string

             = = to check for the equivalence of both strings.

12. (a) (i) Explain the protected data with private and public inheritance. (8)

    (ii) Write a C++ program for to solve eight queens problem with friend functions. (8)

Or

    (b) Write an example program for virtual functions and pure virtual functions with suitable algorithm. (16)

13. (a) Write the pseudo code for the following :

    (i) Split a stack into two. The first contains the bottom half elements and the second contains the remaining elements. (8)

    (ii) Combine two stacks by placing all elements of the second stack on top of those in the first stack. (8)

Or

    (b) Write an algorithm to perform each of the following operations

    (i) Reverse a list, so that the last element comes first and so on. (5)

    (ii) Return the sum of integers in a list. (6)

    (iii) Delete every third element from a list. (5)

14. (a) Draw the result of inserting 20, 10 and 24 one by one into the AVL tree given below. Draw the tree after each insertion. Explain the operations of the AVL tree. (16)
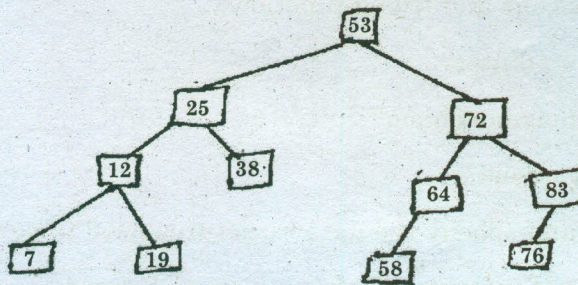
Or

    (b) (i) Explain spanning tree and minimal spanning tree with examples. (8)

    (ii) Explain the Network flow problems and their solutions. (8)

15. (a) For which sorting divide and conquer technique is used. Write its algorithm with explanation to sort 10 values.

Or

    (b) Give short notes of :

    (i) Merge sort with suitable example. (8)

    (ii) Quick sort with suitable example. (8)

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